

We claim:

- 5 1. A method of increasing neural stem cell number, comprising providing an effective amount of an estrogen to at least one neural stem cell under conditions which result in an increase in the number of neural stem cells.
- 10 2. The method of claim 1 wherein the neural stem cell is located in the brain of an animal.
- 15 3. The method of claim 2 wherein the neural stem cell is located in a subventricular zone of the brain.
- 20 4. The method of claim 1 wherein the estrogen is administered to a ventricle of the brain.
- 25 5. The method of claim 1 wherein the estrogen is administered systemically.
6. The method of claim 1 wherein the animal is an adult animal.
7. The method of claim 1 wherein the neural stem cell is cultured *in vitro*.
8. The method of claim 1 wherein the estrogen is estradiol.
9. A method of identifying a gene which participates in estrogen induced neural stem cell increase, comprising:
 - (a) providing a culture of neural stem cells;
 - (b) incubating the culture of neural stem cells in the presence of estrogen;
 - (c) preparing cDNA from neural stem cells cultured without estrogen and neural stem cells of step(b), respectively; and

(d) comparing the cDNAs in step (c) to identify cDNAs which are induced or suppressed by estrogen.

10. The method of claim 9 wherein the induction or suppression is at least two fold.

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11. The method of claim 9 wherein the culture of neural stem cells is incubated in the presence of estrogen for less than 24 hours in step (b).

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12. The method of claim 9 wherein the culture of neural stem cells is incubated in the presence of estrogen for less than 12 hours in step (b).

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13. The method of claim 9 wherein the culture of neural stem cells is incubated in the presence of estrogen for about 6 hours in step (b).

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14. A method of treating or ameliorating a neurodegenerative disease or condition in a mammal, comprising administering an effective amount of an estrogen to the mammal.

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15. The method of claim 14 wherein the disease or condition is brain injury.

16. The method of claim 15 wherein the brain injury is a stroke.

17. The method of claim 14 wherein the disease or condition is selected from the group consisting of Alzheimer's Disease, Multiple Sclerosis (MS), Huntington's Disease, Amyotrophic Lateral Sclerosis, and Parkinson's Disease.

18. The method of claim 14 wherein the estrogen is estradiol.

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19. The method of claim 14 wherein the mammal is an adult mammal.

20. The method of claim 14 wherein the estrogen is administered to a ventricle of the brain of the mammal.

5 21. The method of claim 14 wherein the estrogen is administered systemically.